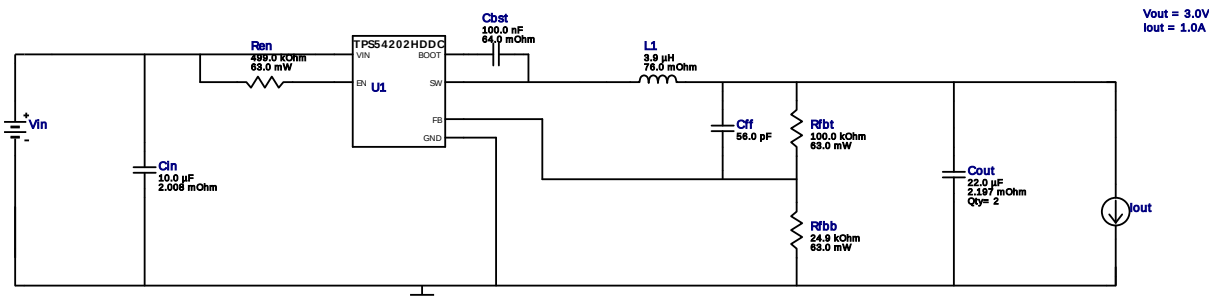


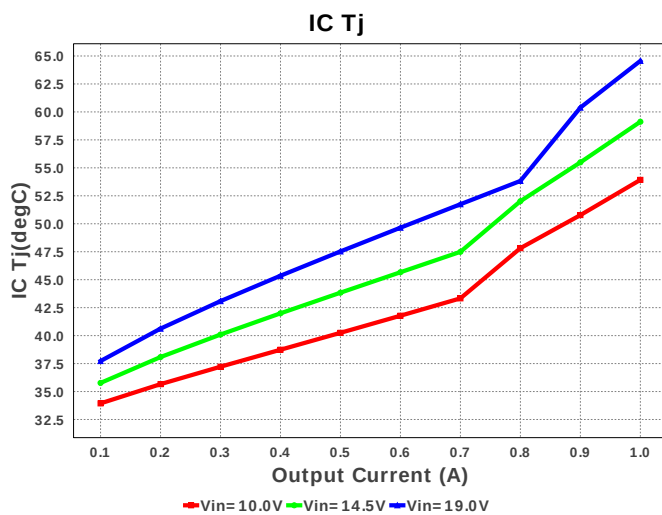
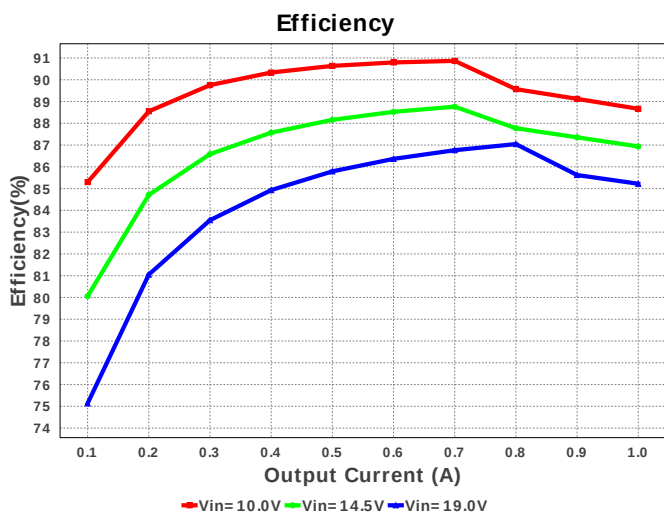
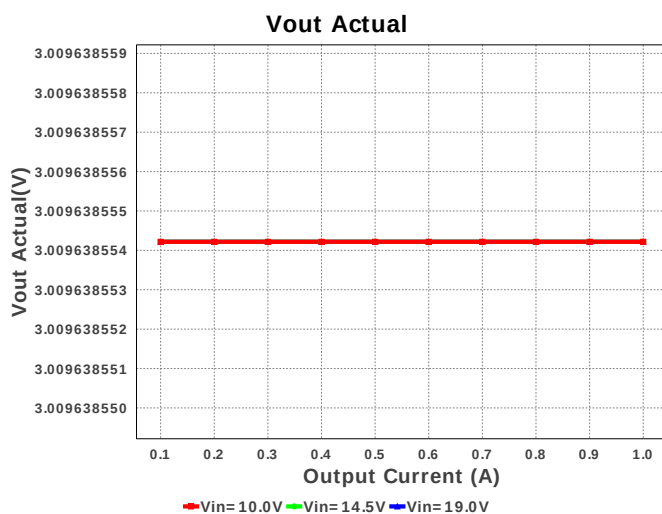
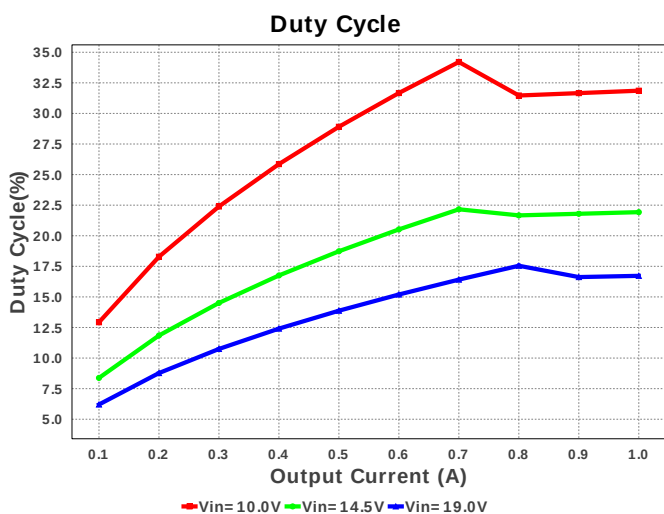
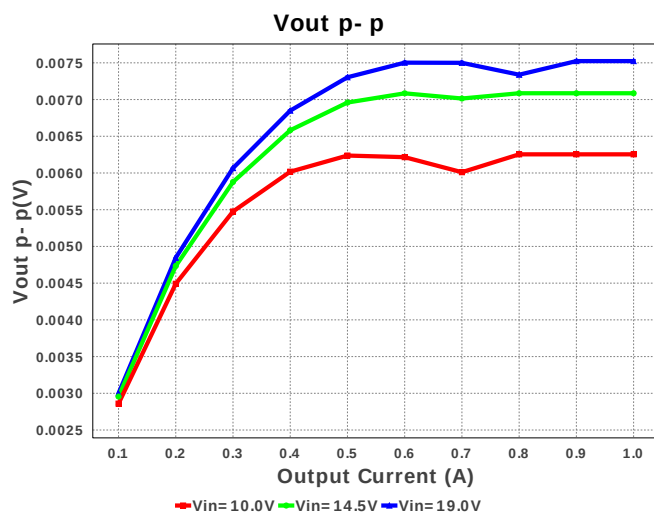
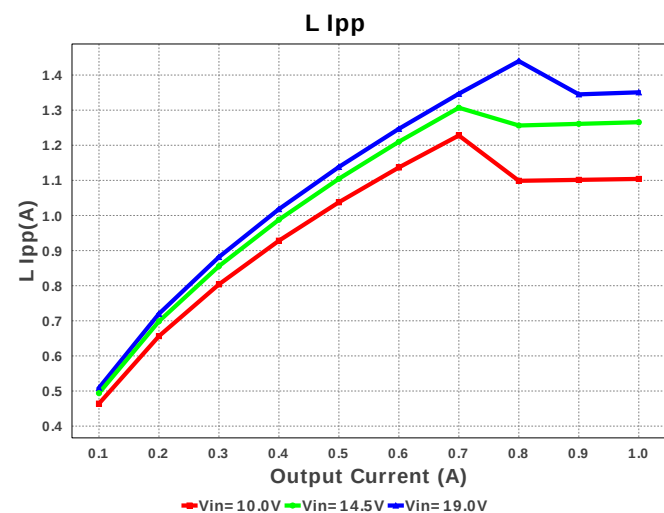
WEBENCH® Design Report

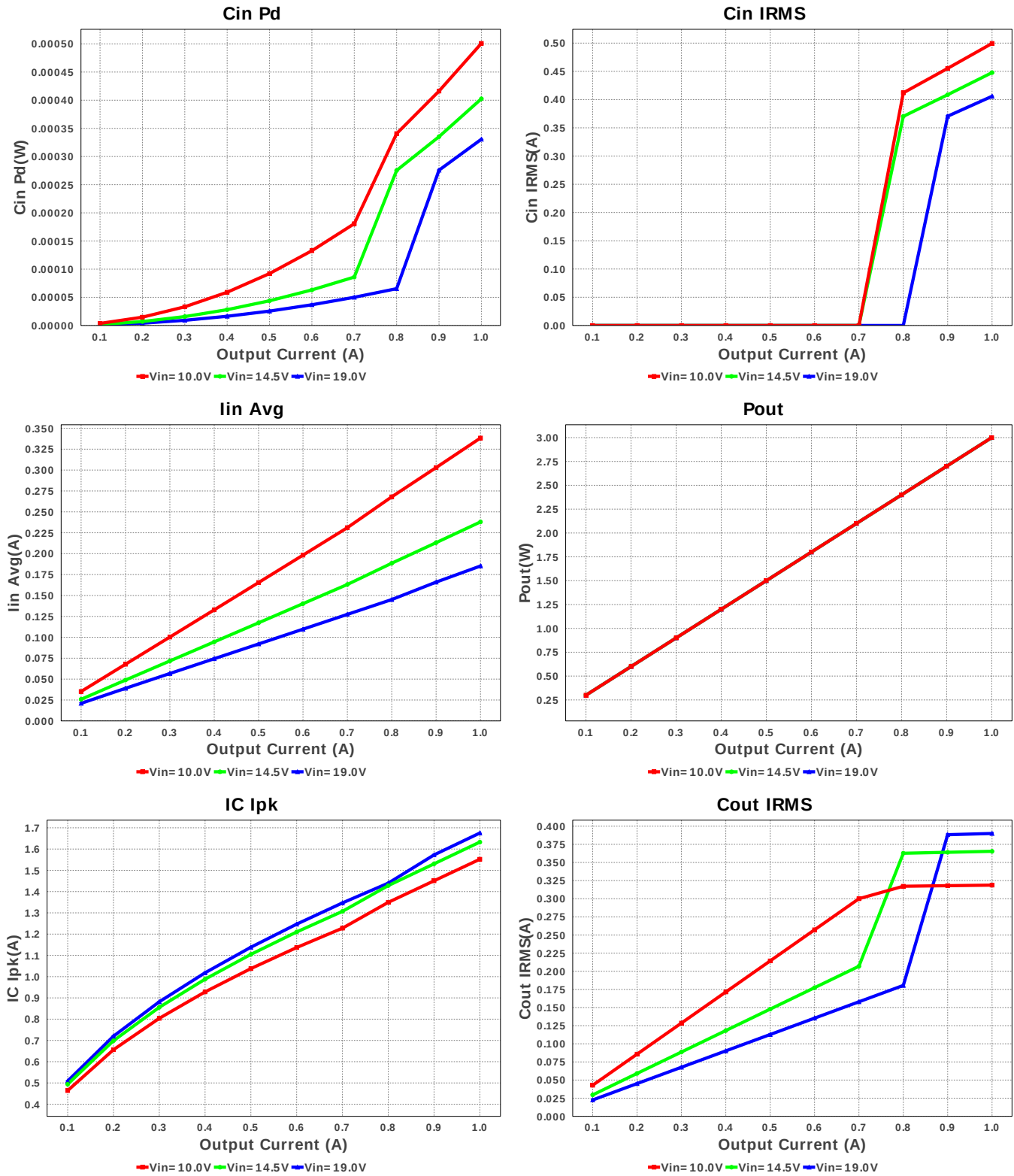
Design : 4728729/8 TPS54202HDDCR
TPS54202HDDCR 10.0V-19.0V to 3.00V @ 1.0A

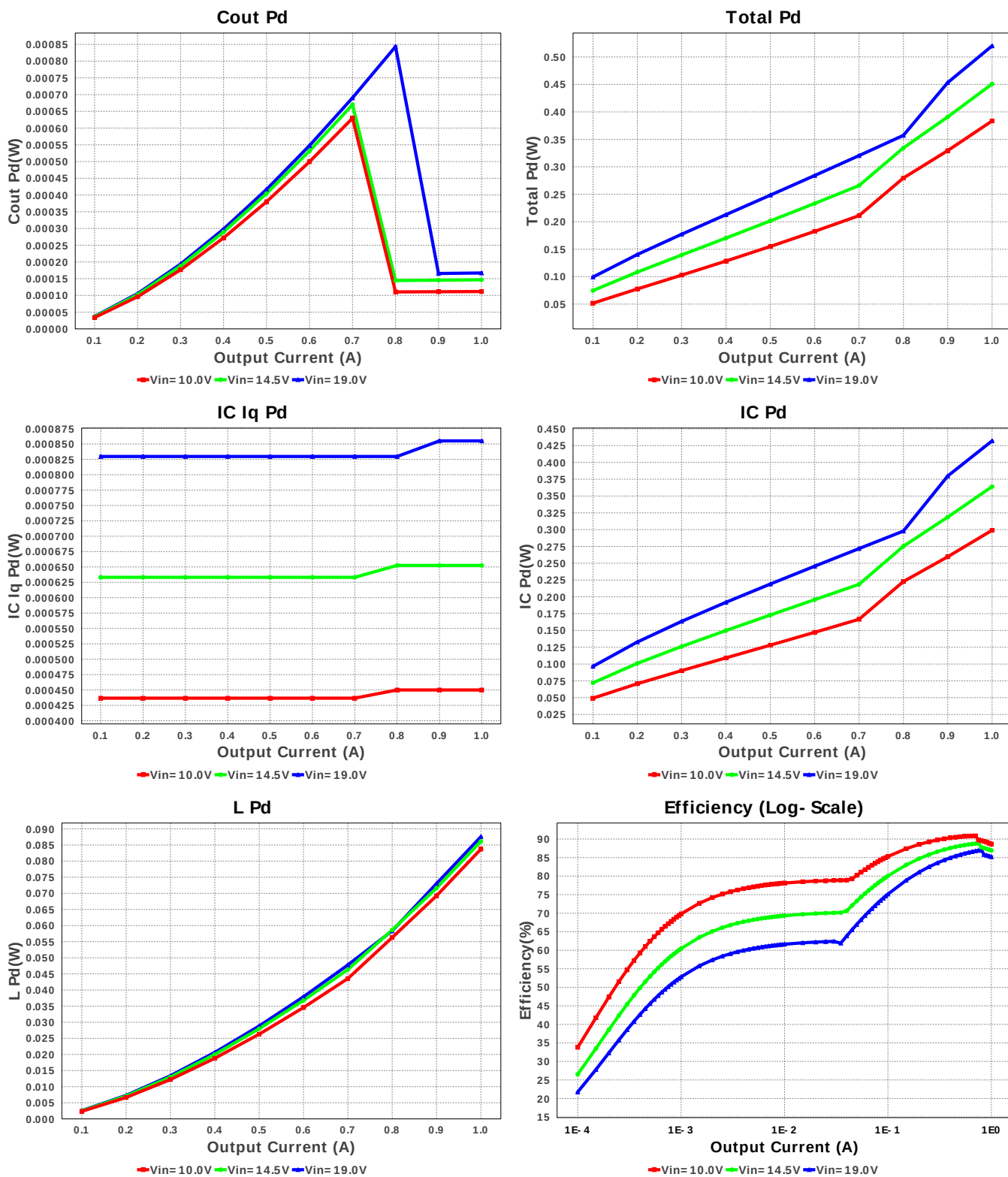


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
2.	Cff	Kemet	C0201C560J3GACTU Series= C0G/NP0	Cap= 56.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
3.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	\$0.22	1210_280 15 mm ²
4.	Cout	TDK	C4532X5R1E226M Series= X5R	Cap= 22.0 uF ESR= 2.197 mOhm VDC= 25.0 V IRMS= 0.0 A	2	\$0.50	1812 23 mm ²
5.	L1	Bourns	SDR0403-3R9ML	L= 3.9 uH DCR= 76.0 mOhm	1	\$0.18	SDR0403 28 mm ²
6.	Ren	Vishay-Dale	CRCW0402499KFKED Series= CRCW..e3	Res= 499.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	Rfbb	Vishay-Dale	CRCW040224K9FKED Series= CRCW..e3	Res= 24.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
8.	Rfbb	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	U1	Texas Instruments	TPS54202HDDCR	Switcher	1	\$0.50	DDC0006A_N 10 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	405.818 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	389.944 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.675 A	Current	Peak switch current in IC
4.	Iin Avg	185.27 mA	Current	Average input current
5.	L Ipp	1.351 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	10	General	Total Design BOM count
7.	FootPrint	117.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	500.0 kHz	General	Switching frequency
9.	Pout	3.0 W	General	Total output power
10.	Total BOM	\$1.95	General	Total BOM Cost
11.	ICThetaJA Effective	80.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance

#	Name	Value	Category	Description
12.	Vout Actual	3.01 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Duty Cycle	16.722 %	Op_point	Duty cycle
14.	Efficiency	85.223 %	Op_point	Steady state efficiency
15.	IC Tj	64.564 degC	Op_point	IC junction temperature
16.	IOUT_OP	1.0 A	Op_point	Iout operating point
17.	VIN_OP	19.0 V	Op_point	Vin operating point
18.	Vout p-p	7.524 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	330.694 μ W	Power	Input capacitor power dissipation
20.	Cout Pd	167.034 μ W	Power	Output capacitor power dissipation
21.	IC Iq Pd	855.0 μ W	Power	IC Iq Pd
22.	IC Pd	432.046 mW	Power	IC power dissipation
23.	L Pd	87.556 mW	Power	Inductor power dissipation
24.	Total Pd	520.17 mW	Power	Total Power Dissipation
25.	Vout Tolerance	1.617 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	19.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	TPS54202H	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS54202H Product Folder : <http://www.ti.com/product/TPS54202H> : contains the data sheet and other resources.

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